Mid Evaluation Report

BYOP

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MID EVAL GOALS

As per the weekly plan as I stated in my Proposal earlier, below are the things I planned to implement in initial 2 weeks:

- Studying the Pix3D & ShapeNet dataset, in depth analysis of all the features provided with.
- Setting up data pipelines to load and preprocess the 2D & 3D data efficiently. (The data consisted of many types of variations having a large variety of models.)
- Baseline model setup : Implementation of a basic architecture of Variational Auto-encoder.
- Studying about GAN's and code along with them.
- Monitoring basic performance metrics and visualising intermediate outputs to validate that the 3D object reconstructions are plausible.
- Setting up evaluation metrics like IoU for voxel reconstructions/mesh reconstructions.

CURRENT STATUS

I was able to cover decent portion of my stated goals. But, what things that I could not implement are stated below:

- Could not train it on the whole dataset, not even half of it. I kept on trying to reduce model size, change some architecture elements.
- Evaluation metrics were not setup.
- Able to train on a very small portion and able to generate the very first basic results of reconstruction. (Functional pipeline)

- Could not resolve tensor shape errors of VAE implementation. But will be completing this portion post ETE.

PROBLEMS FACED

- Tensor Shape issues. The dataset is quite heavy for the model. Requires a lot of time in passing through. 3D objects are quite difficult to handle as I have been provided with Mesh, Voxel points, (Faces, Vertices) data, so handling with them posed a challenge.
- GPU constraints. Forced to keep batch_size = 1.
- GAN's coding, faced challenges.

GOALS POST ETE

Work left behind to do:

- Will be working with the model architecture, ensuring smooth running of conditional DCGAN's (although a basic pipeline is setup already)
- Complete training including hyperparameter tuning for the model (requires ample amount of time (a week or so) , as I will need to work on model complexity issues, and dataset is large).
- Will be setting up pipeline for AR deployment of the 3D objects generated via model.
- And removing any ambiguities if found complying with final directory structure.